



building a science, technology, engineering, and math agenda

THE NGA CENTER FOR BEST PRACTICES SCIENCE, TECHNOLOGY, ENGINEERING AND MATH CENTER GRANT PROGRAM

I. Introduction

The National Governors Association Center for Best Practices (NGA Center) announces the availability of this Request for Proposal (RFP) for grants to states to engage in K-12 science, technology, engineering, and math (STEM) education redesign that supports a state economy's innovation capacity under the *Science, Technology, Engineering, and Math (STEM) Center Grant Program*. These grants are made possible with the generous support of the Bill & Melinda Gates Foundation and the Intel Foundation.

The STEM Center Grant program is part of NGA Chair Janet Napolitano's *Innovation America* initiative that is providing governors policy tools to enhance the innovation capacity of their states to compete in the knowledge-based economy. The STEM Center Grant Program builds on the recommended strategies in the NGA publication *Building a Science, Technology, Engineering, and Math Agenda* and supports the ongoing high school redesign work in the *NGA Honor States Grant Program*. More information on these initiatives is available at www.nga.org. Additional copies of publications are available upon request.

State K-12 education systems must ensure that all students graduate from high school with essential competencies in science, technology, engineering, and math. These competencies are integral to improving overall high school graduation and college readiness rates and supporting a state economy's innovation capacity related to the businesses that operate within their leading economic clusters. The STEM Center Grant Program offers governors the opportunity to (1) create a new STEM Center (2) support the development of a network of STEM Centers or (3) support the refocusing and repurposing of an existing STEM Center. States may use the STEM Center Grant to focus on aligning K-12 STEM education requirements and expected outputs with postsecondary and workplace expectations; building capacity in STEM teacher quality and quantity, data systems, and public will for change to implement an aligned system; and identifying emerging best practice models in STEM education and bringing them to scale. The NGA Center will award up to six states grants of no more than \$500,000 over two years.

The period of performance for the STEM Centers Grant will be August 2007 through July 2009. Only proposals submitted by the governor will be accepted. Proposals must be received no later than May 15, 2007 at 5:00 P.M. Eastern Daylight Time.

II. General Information on Review Process

The grantees and award amounts will be determined by a National Selection Committee that is independent of NGA and the NGA Center. A numerical score will be assigned to each application per the proposal selection criteria. Based on numerical score ranges (on a scale of 100), states will be selected as finalists by mid-June 2007 and move on to the next step in the review



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process. NGA Center will conduct phone interviews with these states and gather additional documentation on behalf of the National Selection Committee during June 2007. Decisions of the National Selection committee are final. Prior to the committee's full review of state applications, a single state application will be randomly selected as a prototype

Awards will be announced in July 2007. State applicants who do not receive an award may request access to the scoring rubric and a briefing about how their proposals were considered.

The NGA Center may withdraw or modify this RFP as it deems appropriate. This Request for Proposal is not binding on NGA, nor does it constitute a contractual offer. Without limiting the foregoing, NGA reserves the right, in its sole discretion, to reject any or all proposals; to modify, supplement, or cancel the RFP; to waive any deviation from the RFP; to negotiate regarding any proposal; and to negotiate final terms and conditions that may differ from those stated in the RFP. Under no circumstances shall NGA be liable for any costs incurred by any person in connection with the preparation and submission of a response to this RFP. However, at this time the schedule is as follows:

Date	Action
February 25, 2007	RFP released to states
May 15, 2007	Deadline for submission of proposals
July 2007	Grant awards announced

National Selection Committee

The NGA Center will manage the RFP process. The NGA Center will convene an independent National Selection committee that will make decisions about grant awards to states. The Committee will meet to review the grant proposals in early June 2007. The Committee will include at least one former governor, a representative of the Bill & Melinda Gates Foundation, a representative of the Intel Foundation, a CEO of a leading innovative firm, and national experts with experience changing state policies to improve K-12 student achievement in STEM competencies to support a state economy's innovation capacity. Final decisions of the National Selection Committee will include the quality of state responses to this RFP (total points earned out of 100); the extent to which the governor and his/her staff participates actively in NGA and whether the state is in good standing with the organization; and factors valuing diversity (e.g., relationship of proposed state activities for the grants with the recommended strategies described in *Building a Science, Technology, Engineering, and Math Agenda*; geographic; and partisan representation). Decisions of the National Selection Committee are solely within its discretion and are not subject to challenge.

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SUPPORT TO APPLICANTS

NGA Center staff will arrange two initial conference calls for states interested in applying, to be held on March 12, 2007 from 3:00 to 4:30 p.m. EDT and on March 15, 2007 from 3:00 to 4:30 p.m. Eastern Daylight Time. NGA Center staff and national experts will participate in the calls. In addition, NGA Center will arrange a follow-up video conference for interested states with specific experts.

During these conference calls and the video conference, NGA Center staff will lead a discussion of how to use Attachment A (*Gap Analysis*) of this document as the starting point for developing a strong application, review application requirements, and introduce the competencies of national technical assistance providers. States interested in participating in one of the conference calls or the video must confirm by email to Charlie Toulmin at ctoulmin@nga.org or Meghan Groome at mgroome@nga.org.

Throughout the grant period, the NGA Center will host technical assistance sessions to help state teams meet their goals and objectives. It is expected that grantee states will attend these sessions as well as send representatives to the annual NGA Center Governors Education Policy Advisors' Institutes to be held in 2008 and 2009.

III. Allowable Grant-Funded Activities

Grants can be used to fund the following types of activities directly related to the activities described in the state's proposal. Examples of **allowable expenses** include:

- Paying for time and travel expenses for consultants and experts;
- Paying for time and travel expenses for state staff;
- Covering travel and meeting expenses for meetings with consultants, technical assistance providers, officials in other states, and/or stakeholders;
- Producing relevant publications and on-line resources; and
- Developing communications materials, including public service announcements that promote the importance of K-12 STEM education redesign and improvement to the state's economic future to the general public.

Grant funds cannot be:

- Substituted for ongoing program expenses;
- Used for lobbying; or
- Used for purchasing equipment (e.g., computers).

IV. Matching Requirement

For each dollar in grant funds, the state must make an in-kind match of equal value. Funds provided for a match must be used to support the project and must be in addition to, and therefore supplement,



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funds that would otherwise be made available for the stated program purpose. The matching funds can be cash or in-kind contributions (personnel costs) from state, federal, and private sources.

Timing: Matching contributions need not be applied at the exact time or in direct proportion to the expenditure of grant funds. However, the full matching share must be expended by the end of the grant period.

Records: Grantees must maintain records that clearly show the source, amount, and timing of all matching contributions.

Documentation: Contributions (cash and in-kind) shall be accepted for cost sharing or matching purposes when such contributions meet the following criteria:

- Are verifiable from the grantee's records;
- Are necessary and reasonable for proper and efficient accomplishment of project objectives; and
- Are allowable under the applicable federal cost principles as detailed in OMB Circular A-87.

V. Awards

The NGA Center will enter into a sub-grant agreement with grantee states. The agreement will be for one year (August 1, 2007 through July 31, 2008). Upon satisfactory progress of the state toward its goals and continued support to the NGA Center by the Bill & Melinda Gates Foundation and the Intel Foundation, an amendment to the sub-grant agreement will be issued for an additional one year period (August 1, 2008 through July 31, 2009). Each grantee state must agree to participate in an independent evaluation.

VI. Financial Reporting and Payment Schedule

FINANCIAL REPORTING

The state files a progress report and a financial report on the following schedule:

- Year One report through January 31, 2008 filed no later than February 28, 2008
- Year One report through July 31, 2008 filed no later than August 31, 2008
- Year Two report through January 31, 2009 filed no later than February 28, 2009
- Year Two final report through July 31, 2009 filed no later than August 31, 2009

The state's progress report includes an evaluation of goals accomplished and tasks undertaken. The state's financial report shows actual expenses compared to the grant budget and documents matching funds expended by the state. In Year One of the grant, the state must document a minimum 75 percent match of the actual expenses to date. In Year Two of the grant, the state must document the full 100

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percent match of the actual expenses to date.

PAYMENTS

Upon execution of the sub-grant agreement, 50 percent of the Year One award amount will be advanced to the state. Once the state has expended its 50 percent advance, additional funds will be released as the state submits invoices based on actual or proposed future expenditures in the prescribed format.

Following execution of the Year Two amendment, 50 percent of the Year Two award amount will be advanced to the state. As in Year One, once the state has expended its 50 percent advance, additional funds will be released as the state submits invoices based on proposed expenditures in the prescribed format. However, 10 percent of the Year Two funds will be retained until the final financial report has been submitted by the state no later than August 31, 2009 and accepted by NGA Center. The final financial report must include documentation for the full amount of the state's matching requirement or the remaining ten percent retained payment may be withheld.

VII. Intellectual Property

The state will grant the NGA Center, the Bill & Melinda Gates Foundation, and the Intel Foundation a nonexclusive, worldwide, royalty-free license to (i) use, copy, and modify all final products of the grant and (ii) publicly perform or display and distribute (directly or indirectly) copies of the final products or any modified final products to further the charitable purposes of NGA Center, the Bill & Melinda Gates Foundation, and the Intel Foundation. The final products of the grant include all reports, drawings, studies, specifications, estimates, maps, computations, computer programs, and other data (writing, sound recordings, or other graphic representations) prepared by or for the state under the terms of the grant. If this grant provides for the development of systems analysis products, models, electronic data processing systems, software and related services, the methods, material, logic, and systems developed under the grant may be used as the NGA Center, the Bill & Melinda Gates Foundation, and the Intel Foundation see fit, including the right to re-use and republish the same without limitation.

VIII. Required Proposal Content and Selection Criteria

Governors' offices are invited to submit a proposal for the NGA Center for Best Practices STEM Center Grant Program that addresses the required content and selection criteria below. Proposals cannot exceed twelve (12) pages, excluding attachments. Proposals should be written in 11-point font and single-spaced.

NON-NEGOTIABLES

Applications must describe how the state will engage in the following non-negotiable activities in support of a STEM Center Grant:

- Adopt and implement the NGA Graduation Rate Compact as a longitudinal, 4-year cohort



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high school graduation measure that tracks individual students and permits valid comparisons among states.

- Actively participate in the National Education Data Partnership initiative, including use of the SchoolMatters.com Web site, sponsored by Standard & Poors, and other secondary data sources.
- Create and execute a communications plan to build and sustain public support for K-12 STEM education redesign and improvement that will help secure the state's economic future. Grantee states will finalize their communications plans after participation in an NGA-sponsored workshop, where consultants will share a STEM Education Toolkit with common communication messages learned from national research.
- Develop and implement an aligned governance structure for P-16 education to lead an aligned approach to STEM education redesign and improvement that supports the state economy's innovation capacity. This P-16 structure should have gubernatorial leadership, or leadership accountable to the governor, and should have explicit responsibility for a discreet number of objectives in STEM education policy. For states that do not have this structure in place, please provide information regarding a planned start date.
- Work with NGA Center staff to set specific 10-year performance goals (e.g. number of students taking upper level math and science courses, number of students scoring as college ready on math and science assessments) for student achievement and attainment in K-12 STEM education (disaggregated by student race/ethnicity and family income).
- Publicly report the objectives of the STEM Center Grant and the identified 10-year goals along with baseline and improvement data.

SELECTION CRITERIA (AND POINTS TOTALING 100)

A. COMPLETE A GAP ANALYSIS OF THE STATE'S CURRENT POLICY LANDSCAPE FOR K-12 STEM REDESIGN TO SUPPORT THE STATE ECONOMY'S INNOVATION CAPACITY

POINTS: 25

States must complete the two parts of Attachment A. The process of completing Attachment A requires states to address guiding questions related to the recommendations in *Building a Science, Technology, Engineering, and Math Agenda* in preparing this gap analysis. The governor, or the designated Design Team leader, should convene key stakeholders (e.g., the governor, legislative leaders, K-12 and higher education leaders, college presidents, business leaders from the state's strongest economic clusters, district superintendents, principals and STEM teachers, providers of informal STEM education, providers of STEM teacher preparation and professional development) to complete this attachment.



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State responses to Attachment A may be of any length and do not count toward the limit of 12 pages for the application.

B. DESCRIBE TEAM LEADERSHIP AND MEMBERSHIP

POINTS: 10

- A strong team of key stakeholders in the state is critical to the success of a STEM Center Grant. Participating states must create a STEM Center Design Team to implement this project. The Design Team must ensure the STEM Center or Network of Centers will be integral to a STEM education agenda that supports the innovation capacity of the state's economy. Each state must also designate a team leader based on the individual's identified knowledge, skills, and influence to successfully implement the project.

Please provide letters of interest and commitment from team members, including the following required individuals:

- the governor;
- the chief education adviser to the governor;
- the chief economic development adviser to the governor;
- a legislative leader;
- the chief state school officer;
- the chief higher education executive officer;
- the highest ranking state government official on economic development;
- two business leaders from two of the state's leading economic clusters;

Please describe the following:

- How do team members reflect the key stakeholders who can move (or stop) a K-12 STEM education redesign agenda that supports the innovation capacity of the state's economy?
- Does the team's composition support bipartisan leadership at the state level?
- How will the state involve school districts, postsecondary education, the business community, and informal STEM education organizations (museums, etc.) in the design and implementation phases of this grant?

C. DESCRIBE THE GOALS OF A STEM EDUCATION AGENDA THE STATE SEEKS TO SUPPORT THROUGH A STEM CENTER GRANT. PROVIDE METRICS WITH INDICATORS AND BENCHMARKS THE STATE WILL USE TO MEASURE PROGRESS TOWARD ITS GOALS.



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POINTS: 5

Acceptable indicators that measure the goals of the STEM education agenda may include:

- gains in public understanding of and support for K-12 STEM education redesign as an integral part of improving high school graduation rates and supporting the state's innovation capacity;
- increased press coverage across the state on student achievement and attainment in K-12 STEM education;
- increased readiness of high school graduates for college level work in STEM areas, as measured by numbers of students taking upper level math and science courses and data on student participation and high achievement on college ready assessments (e.g. curricula and/or exams in Advanced Placement (AP), ACT, SAT, International Baccalaureate (IB), State Scholars)
- increased readiness of high school graduates for postsecondary pathways in STEM areas as measured by success in first year STEM courses in postsecondary education (community colleges and four-year institutions) and training (e.g. industry certification programs);

D. CHOOSE AN APPROPRIATE STRUCTURE

POINTS: 5

States must designate one of the following structures that best fits a state's evidence-based STEM education agenda and the findings detailed in Attachment A. The STEM Center Grant may:

1. Support the development of a new STEM Center in the state, **OR**
2. Support the development of a network to leverage the separate activities of two or more existing STEM Centers in the state, **OR**
3. Support the refocusing and repurposing of an existing STEM Center in the state in support of one or more of the core objectives of this grant.

This section must first identify toward which of the above three structures the state would direct its grant and justify that choice, using reference to Attachment A as appropriate.

E. DESCRIBE WHICH OBJECTIVES THE STATE WILL FOCUS ON THROUGH A STEM CENTER GRANT. DESCRIBE THE SPECIFIC ACTIVITIES OF A STEM CENTER OR NETWORK OF STEM CENTERS FOR WHICH THE STATE SEEKS FUNDING.

POINTS: 10

State applications for a STEM Center Grant must describe how the Grant will address **one or more** of

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the following core objectives in supporting a STEM education agenda in a state that supports the economy's innovation capacity. Please refer to Attachment A as necessary.

1. Align K-12 STEM education requirements (standards, curricula, and assessments) and outputs (achievement) with postsecondary and workplace expectations for STEM competencies of entering students and employees.
2. Improve the quality of STEM teachers and the ability of school and district leaders to lead STEM education reform.
3. Seek innovative new school, curricula, assessment, and standards models in STEM education and bring successful models to scale.
4. Benchmark state K-12 standards, assessments, and curricula in STEM areas to top performing nations in STEM education achievement and attainment (e.g. via state participation in the Trends International Mathematics and Science Study (TIMMS) or the Program for International Student Assessment (PISA))
5. Develop a public-private partnership in one or more regions of the state, between leading economic clusters; K-12 districts; postsecondary institutions; state; county, and local government; and the general public – to redesign a region's K-16 STEM education system to support the regional economy's innovation capacity

F. PROVIDE THE FOLLOWING INFORMATION IN A TWO-YEAR WORK PLAN:

POINTS: 20

The application must describe the following in a two-year work plan for a STEM Center Grant. States must describe how they will measure progress in the two-year work plan by matching a progress measure with each bullet point below.

- The specific activities of the grant and how those activities support the structure and objectives of the grant and relate to the recommendations in *Building a Science, Technology, Engineering, and Math Agenda*;
- a month-by-month implementation timeline with persons/groups responsible;
- policy changes required to initiate and sustain efforts of the grant beyond the current governor's term (e.g., legislation, executive order, regulatory change);
- strategies for building public support for policy actions in support of the grant's objectives and how the major stakeholders will be engaged; and
- the budget, including how in-kind resources will support each proposed activity.

Acceptable progress measures in the two years of the grant may include:



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- an expanded number of STEM focused schools at grades 6-12 in the state that serve all student groups;
- realigned federal and state funds consistent with the state's plan for K-12 STEM education redesign and improvement;
- an increased number of college level credits in STEM areas earned by high school students (e.g. AP, dual credit) and transferred to a postsecondary institution;
- an increased number of K-12 students taking higher level math courses beyond Algebra 1;
- an increased number of students taking three lab science courses and at least two courses among Biology, Chemistry, and Physics;
- an increased number of students taking pre-college engineering/design courses;
- an increased number of K-12 students participating in college ready assessments and scoring as college ready in STEM areas (e.g. AP, ACT, SAT, IB);
- an increased number of first year college students indicating a preference for study in STEM areas;
- an increased number of STEM teachers annually produced by teacher preparation programs in the state (whether postsecondary based or non-traditional programs);
- An increased number of K-12 teachers receiving certification in STEM content areas annually;
- An increased number of students enrolled in career technical education (CTE) programs focused on STEM related occupations.

G. CONNECTIONS BETWEEN THE STEM CENTER GRANT AND OTHER STATE ACTIVITIES

POINTS: 5

Describe how the state's STEM Center Grant will complement other ongoing activities and opportunities in the state (including other foundation-funded initiatives) to help advance the goals of the Grant. Examples of other activities include a state's participation in the NGA High School Honor States Grant Program, a state's work on STEM education requirements, assessments and standards as part of the American Diploma Project and other initiatives through Achieve, Inc, and efforts to develop leading economic clusters in the state (e.g. the state WIRED initiative, the Great Lakes Collaborative).

H. GOVERNANCE STRUCTURE

POINTS: 5

State applications must describe the governance structure of the STEM Center or Network of Centers

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the grant would support. This description must include where the STEM Center or Network of Centers would be located, which stakeholders including representatives of the state's leading economic clusters are a part of the governing structure and how the governor's office is included, how decisions on direction and activities will be made. The governance structure should reflect the focus on innovation, at the same time it should be accountable to the governor and other members of the STEM Design Team. The description must also make clear how the governance structure for the STEM Center or Network of Centers will interact with a state's existing or planned P-16 Council, including to what extent the Council will have decision-making authority over the STEM Center and how their respective efforts will be coordinated.

I. DEMONSTRATE READINESS FOR CHANGE

POINTS: 5

The success of a STEM Center Grant depends on the readiness of a state, among state policy makers and the general public, to build a STEM education agenda that supports the state economy's innovation capacity. State applications can use the following guiding questions to demonstrate that readiness for change:

- How have the governor and other state policy makers demonstrated their commitment to building an effective STEM education policy agenda (e.g., funding or other legislative proposal, Executive Order, or public pronouncement of the issue) that supports the state economy's innovation capacity?
- To what degree has the state demonstrated a commitment to change by implementing innovative policies and practices that support K-12 STEM education redesign, improved student achievement and attainment in STEM areas, and increased college and work readiness in STEM competencies (e.g., using strategies in *Building a Science, Technology, Engineering and Math Agenda*)?
- Have the team members worked successfully together in the past and/or are they currently working together on an initiative? How well is the state positioned politically to implement the proposed activities?

J. A BUDGET DETAILING THE STATE'S PLANS FOR SPENDING THE STEM CENTER GRANT

POINTS: 5

States may submit requests for up to \$250,000 annually for the two-year grant period. The budget should be presented in the format outlined in Attachment B, should include documentation of how the state will meet the in-kind match requirement, and should include a budget narrative. The state must



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identify a fiscal agent for the grant.

K. ADDITIONAL CONSIDERATIONS

POINTS: 5

How has the state been engaged in NGA and NGA Center activities? To what extent is the state is currently in good standing with NGA?

REQUIRED CHARACTERISTICS

Throughout the application, states should demonstrate how the STEM Center or Network of Centers a grant would support will:

1. *Be innovative in "thinking outside the box" about STEM education redesign and how to use policy levers to initiate and then design/implement a new system.*
2. *Be sustainable beyond the two-year life of the grant.* The application must describe how the STEM Center or Network of Centers will be financially, programmatically, and politically sustained beyond the next two years.
3. *Address regional differences within the state in student achievement and attainment in STEM areas and employment, both overall and in STEM related occupations.* The application must describe how the STEM Center or Network of Centers will reach all areas of the state and use innovative means of doing so.
4. *Leverage existing programs and grants that can support the STEM education redesign and clusters of business innovation in the state* (e.g. grants from the National Science Foundation, Howard Hughes Medical Institute). The application must describe how the STEM Center or Network of Centers will partner with existing efforts and make use of their lessons learned, as well as support new such opportunities.
5. *The development of public-private partnerships at the state and regional levels* between leading economic clusters, K-12 and postsecondary education, government, foundations, and other non-profits, that ensure the grant links STEM education redesign to the state economy's innovation capacity.

SUBMISSION INFORMATION

Governors' offices must submit their proposal packages by 5:00 pm Eastern Daylight Time on Tuesday, May 15, 2007. Paper or electronic submissions will be accepted. Applications should be submitted to:

Cardella Mingo

National Governors Association Center for Best Practices

444 North Capitol Street, Suite 267

Washington, DC 20001-1512

202/624-5313 (fax)

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Attachment A - Complete the Gap Analysis of the State's Policy Landscape for K-12 STEM Redesign that Supports the State Economy's Innovation Capacity

Attachment A is made up of two sections: the first is a review of economic and education indicators and the second are questions that pertain to the recommendations and strategies in *Building a Science, Technology, Engineering, and Math Agenda*. State responses to Attachment A may be of unlimited length and do not count toward the page limit of 12 pages for the state application. States should also reference the gap analysis throughout the application.

SECTION A

To be eligible for a grant award, a state must provide data describing demand in the state for a STEM educated workforce vs. the current supply, provide data on student achievement and attainment in K-12 STEM education vs. postsecondary and workplace expectations for entering students and employees, evaluate current state policies governing K-12 STEM education, and outline its STEM education redesign agenda to address gaps in these indicators and policies and support a state economy's innovation capacity.

States should review the education and economic indicators included in the state's profile prepared by the Monitor Group. State teams should contact Charlie Toulmin at NGA at 202-624-7879 or ctoulmin@nga.org to access their Monitor state profile. The state may also cite other relevant, state-specific education and economic data as it deems appropriate (e.g. the State New Economy Index authored by Rob Atkinson, other economic and education reports commissioned or produced by the state, number of students taking upper level math and science courses).

SECTION B

Attachment A requires states to address the following guiding questions related to the recommendations and strategies in the NGA publication *Building a Science, Technology, Engineering, and Math Agenda*, to assist states in completing this gap analysis. **States must address all of the questions in Attachment A.** The governor, or the designated team leader, is asked to convene key stakeholders to complete this attachment.

1. ALIGN OUTPUTS (STEM COMPETENCIES IN HIGH SCHOOL GRADUATES) AND INPUTS (EXPECTED STEM COMPETENCIES IN INCOMING STUDENTS AND EMPLOYEES) ACROSS THE K-16 EDUCATION SYSTEM AND INTO THE PRIVATE SECTOR

- What types of STEM focused assessments are included in your state's K-12 assessment system? Specifically, does your assessment system include: a) college ready measures; b) high school graduation exams; c) end-of-course exams; d) level exams for movement



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from one grade or one level (e.g. elementary to middle) to the next ; e) diagnostic exams; f) culminating projects; g) industry specific certifications; and/or h) others? Which of these are required by the state for all students and which are voluntary on the part of districts, schools, and/or students?

- What are the required standards, assessments, and courses in STEM areas at the elementary (K-8) level? Do the knowledge and skills (STEM competencies) students are expected to demonstrate by the end of grade eight align with the STEM knowledge and skills needed for success in high school?
- What are the courses and credits in STEM areas currently required for high school graduation in your state? Do these align with requirements of the state's postsecondary education system and/or individual institutions for admission? Do the STEM requirements for high school graduation match the STEM curricula recommended by the ACT, the Center for State Scholars, and/or the American Diploma Project? Does the state provide districts and schools with the flexibility to package required STEM content in different ways (e.g., Algebra I, Integrated Math I, etc.), while ensuring consistent quality and content of STEM courses?
- Based on current remediation rates in first year college STEM courses, what are the gaps in STEM competencies among high school graduates enrolling in the postsecondary system? Do higher education institutions share data on student performance in first-year STEM courses with sending high schools? How do the high schools and colleges use this data?
- Have the state and its leading employers defined "work ready" standards in STEM areas – the knowledge and skills (STEM competencies) necessary for entry and success in the workplace, either directly out of high school or after some postsecondary education and/or training? Has the state aligned its high school graduation standards in STEM areas with those work ready standards? Does the state require and/or offer work ready assessments (e.g. WorkKeys, Accuplacer, others) for high school students?
- What high-wage, high-skill occupations are expected to grow in the state? What are the STEM skills and knowledge requirements of these jobs? What are the current gaps in knowledge and skills (STEM competencies) among entry level employees identified by leading employers in these economic clusters of innovation in the state?
- Does the state have efforts underway to support collaboration on K-12 STEM education redesign between government, education, and business on a regional basis? Are these collaborative efforts involving the leading economic clusters in the state in a substantive discussion about aligning the goals and strategies of STEM education redesign and improvement with regional workforce needs?
- How many students graduate from high school in the state with an industry-recognized

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credential or other work-ready certification in STEM areas? How many students complete career and technical education (CTE) programs, graduate from high school, and score at proficient or above on state assessments in STEM areas?

- Do the requirements for the state's career and technical education (CTE) pathways in STEM align with secondary level standards, allow students to easily move through the postsecondary system, and lead to meaningful career opportunities in STEM areas?
- What are the state's CTE clusters focused on STEM areas and are those aligned with the high-wage, high-skill occupations expected to increase in the state?
- What are the regional differences within the state in K-12 student achievement and attainment in STEM areas, private sector demand for and supply of STEM educated employees, and projections for growth in high-wage, high-skill STEM related occupations?

**2. DEVELOP THE NECESSARY STATEWIDE CAPACITY TO IMPLEMENT AN ALIGNED AND
RIGOROUS STEM SYSTEM**

- Has the state evaluated its capacity for improving STEM teaching and learning statewide through state participation on international assessments such as the Program for International Student Assessment (PISA) and the Trends in International Math and Science Study (TIMSS) and comparison of its results to top performing nations? If so, please describe the state's efforts.
- The National Data Quality Campaign has identified 10 essential elements of an individual student identifier, longitudinal state data system that can track individual student data in all content areas (including STEM) from P-12 into the postsecondary system. How many of these elements does your state's data system have at present, and what are the plans to continue development?
- Are the state's standards for K-12 STEM teacher knowledge and skills aligned with the state's learning standards in STEM areas for students?
- How many new K-12 teachers with certification in STEM areas does the state produce each year? How many of these new STEM teachers find employment in the state?
- How does the state hold providers of K-12 STEM teacher preparation accountable for producing the quality and quality of STEM teachers the state needs? Are there promising new models of recruiting and preparing STEM teachers?
- How is the state supporting effective use of available state and federal funds for high-quality professional development for STEM teachers? Who are the providers of professional development in the state and how does the state evaluate those providers?
- Does the state support incentives, including performance-based, differentiated



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compensation, to recruit and retain effective STEM teachers? How does the state specifically help low-income, high-minority, low-performing, and hard-to-staff schools recruit and retain effective STEM teachers? How well are any incentives working, and what is the evidence for that conclusion?

- Does the state have effective intermediate capacity (e.g. STEM centers, the state department of education, postsecondary institutions, the business community, the philanthropic sector, museums) to support districts and schools in delivering improved STEM teaching and learning across the state? What is the focus of this intermediate capacity (e.g. alignment, policy, implementation)? Are there effective public-private partnerships at this intermediate level?
- Is the data on student achievement and attainment in K-12 STEM education widely available, and if so, how? Does the state have a plan to communicate the importance of STEM education redesign to the state's economic future to these key stakeholders?
- Are there public-private partnerships supporting informal STEM education outside the K-12 school system (expanded learning opportunities, museum work, etc.) that helps develop and maintain student interest in STEM areas at early ages? Are these out-of-school STEM education efforts connected to the STEM standards, assessments, and curricula in the schools?

3. IDENTIFY EMERGING BEST PRACTICE STEM EDUCATION MODELS, EVALUATE NEW APPROACHES, AND BRING PROVEN MODELS TO SCALE

- What types of STEM focused school options (state funded STEM academies, charter schools, in-district magnet schools, early college high schools) do students in the state currently have? What percentage of the public school population do these schools enroll and graduate? What is the demographic (e.g. race, ethnicity, socio-economic status) profile of students enrolled in and graduating from these schools? How many of these options exist? Has the state assessed the demand and potential supply for additional STEM focused school options?
- Please describe some schools or programs in the state that are especially effective in graduating students from high school prepared in STEM competencies for college. What is the evidence for their success? Are these programs serving all student groups? Does the state plan to support the expansion of these models?
- Please describe some career technical education (CTE) programs in the state that offer students rigorous and relevant pathways into STEM related occupations (e.g. programs resulting in industry certification). What is the evidence for their success? Does the state plan to support the expansion of these models?
- Does the state have required and/or voluntary technology and engineering standards,



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assessments, and/or curricula in place at the K-8 level or high school level? Is the state supporting the expansion of emerging successful models in these areas (e.g. Project Lead the Way)? Are these models engaging students in these disciplines at early grade levels as well as maintaining that interest later? Are these models open to all students?

- How is the state supporting the expansion of college-level learning opportunities for high school students (e.g., Advanced Placement (AP), International Baccalaureate (IB), early college high schools) in STEM areas? What is the evidence for the success of these approaches? Are these opportunities available for all students?
- Are there state programs designed to help low-performing students in STEM areas meet the state standards and course requirements? How are low-performing students targeted and supported? What evidence does the state have these strategies are working?

	PROJECT BUDGET			MATCHING		
	Activity One	Activity Two	Activity Three	Activity One	Activity Two	Activity Three
TOTAL						
PERSONNEL						
Salaries	X	X	X			
Fringe Benefits	X	X	X			
Indirect Cost	X	X	X			
(per approved rate)						
Total Personnel	X	X	X	0	0	0
CONSULTANT						
TRAVEL						
MEETING EX-PENSES						
SUPPLIES						
OTHER EXPENSES:						
TOTAL REQUEST	0	0	0	0	0	0

Attach a budget narrative detailing the items in each activity and cost type.
All expenses must be consistent with state fiscal guidelines.
Meals are not reimbursable unless the participants are on out-of-town travel status.